9/29/10 Joint Public Hearing

1040.01 DEFINITIONS

As used in this chapter:

(a) "Adequate Water" means that the water supply system shall be capable of supplying water in an adequate quantity for its intended usage and meets the standards in Appendix IV.

(b) "County" means the County of Loudoun, Virginia.

(c) "Ground water" means subsurface water occupying the zone of saturation.

(1) "Confined ground water" means a body of ground water overlain by material sufficiently impervious to sever free hydraulic connection with overlying ground water.

(2) "Free ground water means ground water in the zone of saturation extending down to the first impervious barrier.

(d) "Health Department" means the same as Health Director

(e) "Health Director" means the County Health Officer or his duly authorized agent.

(f) "Limestone Overlay District" means those areas of the County, as shown on the County's Zoning Map, which are subject to the Limestone Overlay District, as set forth in the Loudoun County Revised 1993 Zoning Ordinance, as amended from time to time.

(g) "Negative coliform test means a negative test as described in the latest edition of "Standard Method for Examination of Water and Wastewater"

(h) "Person" means any individual, firm, corporation, partnership or other entity, singular or plural.

(i) "Pitless adaptor" means a mechanical, gasketed device which is attached through a hole drilled or cut in the well casing, connecting the pressure tank influent pipe to the pump drop pipe, which is approved for such use by the Water Systems Council, Pitless Adaptor Standard No. 1 (PAS-1), or the National Sanitation Foundation.

(j) "Pollution" means the addition of sewage, industrial waste chemicals or other material harmful to water, whether intentional or not. Sources of sewage pollution may be privies, sanitary sewers, septic tanks, subsurface irrigation or drain fields, seepage pits, sink drains, barnyard wastes, chemical storage tanks, fertilizer stockpiles and like sources by whatever name.

(k) "Potable water" means water that is safe for human consumption and culinary purposes free from pathogenic bacteria, protozoa cysts and other disease producing organisms and free from physiologically harmful chemical and mineral substances.

(l) "Private Water Supply" means a water supply system from which water is not available to the public, its location and outlets being on private property, and serving not more than one dwelling or agricultural unit. For the purpose of this chapter, an agricultural unit shall be comprised of the main dwelling, tenant houses for the farm employees and other related farm buildings. Commercial and industrial units referred to in this subsection are those employing fewer than twenty-five persons where water is not available to the public.

(m) "Public individual well" means a well serving one commercial or industrial unit.

(n) "Public water supply system" means a water supply system serving two or more dwelling, commercial, agricultural or industrial units, or any system serving more than twenty-five persons, or the public.

(o) "Safe water" means potable water meeting the quality standards included or described as primary maximum contaminant levels in the "Virginia Waterworks Regulations," Virginia Department of Health, as specified in Appendix III (as evidenced by analytic test results certified by a laboratory approved to conduct such tests by the Virginia Department of Health).

(p) "Spring" means a natural issue of water from the earth, rock formation or fracture onto the land or into a body of water, the place of issuance being relatively restricted in size.

(q) "Terminus cap" means a well terminus cap which is approved for such use by the Water System Council, Pitless Adaptor Standard No. 1 (PAS-1), or the National Sanitation Foundation.

(r) "Unconsolidated formations" means a formation composed of mud, silt, clay, soft shale, sand or gravel, or creviced rock.

(s) "Water service connection" means the water service connection of a public water supply and shall be considered the effluent connection of he water meter or the effluent pipe of the pressure tank where there is no water meter. The water service connection of a private water supply shall be considered the effluent pipe of the pressure tank.

(t) "Water supply system" means the source, works and auxiliaries for collection, treatment and distribution of potable water from the source of supply to the water service connection.

(u) "Well" means an artificial excavation that derives water from the interstices of he rocks or soil which it penetrates. Wells referred to in Sections 1040.12 and 1040.13 are "shallow" or "deep" depending upon whether they derived water from "free" or "confined" groundwater respectively. However, wells of depths greater than fifty feet in unconsolidated formations shall be classified as deep wells. Any exploration, testing or production well for whatever purpose constructed, is considered a water well, and subject to this chapter, since improper construction can lead to ground water contamination.

(1) "Bored well" means a well that is excavated by means of a soil auger (hand or power) as distinguished from one which is dug or drilled.

(2) "Drilled well" means a well that is excavated wholly or in part by means of a drill (percussion or rotary) operated by cutting or abrasion or by use of a water jet.

(3) "Driven well" means a well that is constructed by driving a casing, at the end of which there is a drive point and screen, without the use of any drilling, boring or jetting device.

(4) "Dug well" means a well that is excavated by means of picks, shovels or other hand tools, or by means of a power shovel or other dredging or trenching machinery, as distinguished from one put down by a drill or auger".

(v) "Well grouting" means the filling of the annular space between the well casing and the natural earth or rock with a mixture of Portland cement or bentonite clay and water applies under pressure from the lower terminus of the grouting to the top of the well.

(w) "Well lot" means a parcel of land extending at least 100 feet in a radius about the well location, attached in fee simple and protected by covenants running with the land for the life of the structure the well serves.

1040.02 APPLICATION OF CHAPTER; COMPLIANCE

(a) The requirements of this chapter shall apply to all new supply systems, both private and public, and they shall also apply to replacements of, or additions to, existing systems.

(b) Building contractors, plumbers, well diggers, well drillers and all persons making installations and/or repairs to existing installations shall be responsible for compliance with applicable sections of this chapter.

(c) Where requirements of this chapter are more stringent than those of the State Health Department, the requirements of this chapter shall prevail. (Ord. 88-14. Passed 9-19-88.)

1040.03 APPROVAL OF SYSTEM REQUIRED PRIOR TO USE

(a) No person shall use or allow to be used, rent or lease for use, any water supply system unless or until such system is approved by the Health Department. The location, source and construction of water supply systems shall conform to the requirements of this chapter and specifications therein pertinent to the type of supply.

(b) Within the Limestone Overlay District, any water supply system and/or well which is proposed to withdraw ground water exceeding a rate of 10,000 gallons per day during any single thirty (30) day period shall be required to submit the results of a Hydrogeologic study conducted in accord with Section 6.240 of the County's Facilities Standards Manual prior to approval of any such water supply system and/or well.

(c) Water supply systems constructed and approved prior to the effective date of this section (Ord 88-14, passed September 19, 1988) shall be approved under this section if:

(1) Construction of the water supply system can be shown to meet the minimum construction standards which were in effect on April 6, 1976; and
(2) Water samples collected by or under the supervision of the Health Department test negative for coliform organisms; or
(3) Water samples collected by or under the supervision of the Health Department test positive, but with a geometric mean of five samples, collected with the intervening time interval of not less than twenty-three hours, resulting in less than 100 "most probable number of organisms" (MPN) per 100 milliliters, when provided with a Department approved means for continuous disinfection, such as chlorination.

(d) Systems permitted and under construction on the effective date of this section shall be approved based on criteria in effect on the date of construction permit issuance. (Ord. 88-14, Passed 9-19-88.)

1040.04 INSPECTIONS

(a) The County Health Director may inspect an entire water supply system or any part thereof, maintained at any premises in the County for the purpose of determining if such system is being constructed, operated or maintained in a sanitary manner so as to produce safe water. Inspections shall be made at reasonable times and, whenever practical, in the company of the owner or occupant of such premises.

(b) The Director may inspect a water supply system, on request by the owner, in order to satisfy requirements or contract contingencies in real estate transactions, including sale and refinancing of property, and shall supply a written report of his findings.

(c) The Director shall provide advice on safe, adequate and potable water supplies. (Ord. 88-14. Passed 9-19-88.)

1040.05 UNSAFE WATER PROHIBITED

(a) No owner, tenant or lessee of any premises supplied with a potable water supply shall misuse or neglect such supply so as to allow the water therefrom to become unsafe for human consumption or other domestic purposes.

(b) No person shall use or allow to be used for human consumption or other domestic purposes a polluted water supply unless treatment is provided to render the water safe for such purposes. (ORD 88-14. Passed 9-19-88)

1040.06 INSTALLATION OF SYSTEMS; PERMIT REQUIRED

(a) Permit Required. No person shall install, construct, repair or extend, or allow to be installed, constructed, repaired or extended, any water supply system, public or private, in the County without first making application therefore to the Health Department and obtaining from such Department a valid permit in the name of a specific person for a specific location. This section shall not apply to the repair or replacement of existing mechanical equipment or plumbing of an existing water supply system.

No person shall obtain a building permit in the County for any structure, the use of which requires a water supply, until one of the following conditions has been met:

(1) Any person applying for a building permit for a structure to be served by a private groundwater well shall first construct and test the well. The applicant must obtain a permit from the Health Department for the construction of such well as required by this section. Water samples from the well shall be taken after the well is developed in accordance with Appendix IV following the text of this chapter and then shall be tested for the contaminant levels established in Appendix III. A copy of all test results shall be provided to the Department and the building permit applicant.

(2) For any structure to be served by an existing public water supply system, the building permit applicant must first obtain a statement from the system owner that such public water supply system is in compliance with State and County regulations and that capacity will be available for the applicant at the anticipated time of connection.

(b) Application for Permit. Application for a permit shall be made on forms furnished by the Health Department and shall contain a description of the location and dimensions of the land on which the water supply system is to be constructed. The Department may require such plans and/or specifications as are necessary to determine the adequacy and safety of the system, and such information shall be made a part of the records of the Department. Applications for a permit to construct a public water supply system which will have fifteen or more connections can be made through the County Health Department, or the applications can be made concurrently to the Division of Water Programs, North Regional Office, Virginia Department of Health.

(c) Approval or Denial of Permit. When the Health Director is satisfied that a proposed water supply system can be constructed or an existing supply used in accordance with the provisions of this chapter, he shall issue a written permit to proceed with construction. Where an existing supply is to be used, a clearance for construction shall be issued.

When the Health Director determines that a proposed water supply system cannot meet the requirements of this chapter and there are no other adequate alternatives, he shall deny, in writing, a permit and specify therein the reason for denial.

(d) Changes in Conditions. Material changes in site conditions under which a permit was issued shall void such permit. No person shall proceed with construction until such time as written approval for the changes has been obtained from the Health Department, provided that such changes can be approved in accordance with the provision of this chapter.

(e) Voidance of Permit. Permits shall be null and void after twelve months from the date of issuance, unless extended, in writing, by the Health Director.

Permits shall be automatically cancelled should the Health Director later determine that a potential health hazard would be created by continuing installation. (Ord 88-14. Passed 9-19-88)

1040.07 INSTALLATION OF WELL WATER SYSTEMS; LICENSE AND BOND REQUIRED.

(a) License Required. No person shall install or repair for another or contract to install or repair for another a well water supply system, private or public, without first making application to, and obtaining an annual license from, the Health Department and meeting the requirements set forth in this chapter.

(b) Issuance of License. The annual license shall be issued by the Health Department upon written application and payment of a license fee, provided that bonding

requirements have been met. Licenses shall be renewed annually between January 1 and January 15 of each year. Renewal of licenses shall be made in writing and shall be the responsibility of the license holder. Applications for new licenses shall be made prior to commencing drilling operations and the fee for such shall not be proratable.

(c) Revocation of Licenses. Conviction of a violation of this chapter shall constitute sufficient cause to revoke or deny a license.

(d) Bonding. All persons contracting to install or repair for another, or installing or repairing for another, a well water supply system, must furnish a bond payable to the County, with a surety approved by the Treasurer, conditions to indemnify and save harmless the County, as well as any other person, from all expenses and damages that may be caused by any neglect or defective or inadequate work done by such licensee, his agents, employees or representatives. Defective or inadequate work shall not be construed to include quantity or quality where such work otherwise complies with this chapter. When such work is deemed defective or inadequate by the Health Department, and the licensee fails to correct the defective or inadequate work within ten days after written notice from the Department to do so, the bond shall be forfeited and the principal and surety on such bond shall be liable therefore, and the licensee shall pay so much on account of such bond as may be necessary to correct such work, and in addition shall pay all damages which may be occasioned to any person by reason of such defective or inadequate work, including costs incurred by the County to handle and process such revocation. Such bond shall be deposited with the County Treasurer. The original bond shall be renewed annually and such bond shall not be terminated for a period less than six months after the expiration date of the last license issued such person under this chapter. (Ord 88-14. Passed 9-19-88)

1040.08 FEES

The County shall establish, set and charge fees as it deems necessary and reasonable to defray the cost of permits and/or licenses, inspections and testing as are required to be issued under this chapter. Such fees are set forth in Appendix I following this chapter. (Ord. 88-14. Passed 9-19-88)

1040.09 LOCATION

All well water supply systems shall conform with the following general principles regarding site.

(a) No water supply for human consumption shall be located within any building except a separate structure housing pump equipment.

(b) Water supplies shall be protected from surface wash or flooding by suitable sloping or ditching of ground surfaces or by suitable dikes or curbs. Water supply systems shall not be located in ground swale areas or flood plains which are subject to surface run-off and/or flooding.

(c) All wells shall be located at a minimum distance from known sources of pollution as set forth in Tables I, and IA, Appendix II, following this chapter.

(d) All wells shall be located on the premises consistent with the general layout, topography and surroundings, including abutting lots.

(e) Any new well which is the water source for a private water supply system shall be located within the boundary of the lot it serves.

(f) Any well which is the water source for a public water supply system may be located on a well lot with lot maintenance provided by an entity or person operating the water system. No fertilizer, insecticide, herbicide or other chemical shall be applied to any well lot. (Ord. 88-14. Passed 9-19-88)

1040.10 GENERAL REQUIREMENTS

(a) Construction and Performance Characteristics. A report shall be made on each well tested in accordance with Appendix IV following this chapter, and such report shall be supplied to the owner and the Health Department by the well driller. Pump tests results shall be supplied to the owner and the Department by the pump installer. Such report shall include, at a minimum, the following:

(1) The type, diameter and length of the casing;
(2) The total depth of the well;
(3) The type, diameter and length of the strainer, if any, and the size of screen openings;
(4) The method of sealing the top and bottom of the screen
(5) The standing (static) water level, that is, the water depth below the ground surface when not pumping;
(6) The yield of the well in gallons per minute, and the elevation of the water surface when pumped at the designated rate, if a pump test is required;
(7) The number of hours the pump is operated at a stipulated rate during the pumping test, if required;
(8) A record of any other pumping performance;
(9) A log and samples of materials encountered during drilling when requested, collected in accordance with Appendix IV;
(10) The physical appearance of the water at the end of the final pumping test; and
(11) The results of analytic tests made to determine potability by the well pump installer, licensed driller or certified professional geologist.

(b) Protection of Wells. Wells under construction or repair shall be protected at all times so as to prevent any drainage or foreign matter from entering the casing. When drilling operations are suspended, as overnight, the casing shall be securely covered or capped. Upon completion of drilling, a secure cap or plug shall be placed on or in the top of the casing. Water used for drilling operations or for tempering or cooling of well tools shall be of approved potable quality.

(c) Disinfection. Upon completion of construction and/or repairs of any water supply system, or following repairs to the pumping equipment, it shall be disinfected and flushed, as provided in Section 1040.16.

(d) Nonacceptable Equipment. No pitcher, split-base or chain bucket pump shall be installed on any water supply system.

(e) Cross Connections. No water service connection shall be made to a frostproof toilet. Where frostproof hydrants are used, adequate draining shall be provided to prevent possible backflow. The ditch excavation between the well and pressure tank is not adequate drainage. There shall be no cross connection between a private water supply system and any other private or public water supply system.

(f) Abandoned Wells. No person shall use an abandoned or unused well for the purpose of disposal of sewage, sewage effluent or other polluting material. The owner of any permanently abandoned well shall immediately fill and/or seal the well with cement or bentonite clay or other equally suitable material under supervision of the Health Director. Permanent abandonment occurs when a well is no longer in active use and/or when the construction of the well no longer meets the requirements of this chapter. As used in this section, "immediately" means within forty-eight hours of drilling completion if the well to be abandoned yields insufficient water, or within thirty days if a previously constructed and operational well is abandoned.

(g) Chemical or Physical Alteration of Wells After Drilling.
(1) Hydraulic fracturing of wells may be permitted by the Director of Health under Section 1040.06 and shall be considered on a case by case basis.
(2) No person shall use explosives in wells.
(3) The use of chemical and biological additives to remove pollutants and/or improve well yields may be permitted by the Director under this chapter and shall be considered on a case by case basis except that the use of such additives shall not be permitted within the Limestone Overlay District.

(h) Drilled Wells Constructed in the Bottom of Dug or Bored Wells. A drilled well constructed in the bottom of a dug or bored well shall not be approved. (Ord 88-14. Passed 9-19-88)

1040.11 CRITERIA FOR APPROVING WATER SUPPLY SYSTEMS (REPEALED)
(Editor's Note: Section 1040.11 was repealed by Ordinance 88-14, passed September 18, 1988)

1040.12 SPECIFICATIONS FOR CONSTRUCTION OF DEEP WELLS.
(a) General Requirements. All casing shall be made up and placed so as to be watertight throughout the depth used. When water is derived from rock formations, the casing shall extend sufficiently far into the rock as to be firmly seated on solid rock, plus a minimum of ten feet. Where screens are used, they shall be so placed as to expose all of the slotted area to the water-bearing formations and shall be securely sealed to the well casing as to be sandtight and the joint shall be made in accordance with good practice.

The well casing shall terminate at least twelve inches above the natural grade surface (preferably eighteen inches) and no well casing shall terminate in a pit, provided that this shall not apply to private wells where proper topographical conditions exist so as to permit a four-inch gravity flow drain, and where the pit walls and floor and ceiling are constructed to house the water supply system

and/or pumping equipment shall have an impervious floor, raintight walls and roof and adequate ventilation. The floors shall be six inches in thickness and shall be sloped away from the well casing with a slope of not less than one inch in eight feet. Where necessary, such structures shall be provided with an adequate drain. The well terminus shall be sealed with a sanitary seal, gasketed and protected from insects, or if utilizing a pitless adaptor, shall use an approved pitless adaptor and terminus cap.

(b) Specifications and Classes of Drilled Wells. All drilled wells shall be cased and grouted in accordance with the following classifications. Grouting shall conform to Section 1040.15. No work shall be considered completed in accordance with the provisions of this chapter unless and until grouting is complete, and such shall be done within ten days after setting of the casing.

(1) Class I wells shall be cased and grouted to solid rock with a minimum casing and grout of 100 feet
(2) Class II-A wells shall be cased to solid rock with a minimum casing of 100 feet and a minimum grout of twenty feet, and shall only be used where the formation encountered precludes the use of fifty feet of grout.
(3) Class II-B wells shall be cased and grouted to solid rock with a minimum casing and grouting of fifty feet.
(4) Class III wells shall be cased and grouted to solid rock with a minimum casing and grout of twenty feet or as required by the Health Department.

(c) Material Specifications.

(1) The minimum standard of quality for steel casing or wrought iron casing pipe shall conform to the requirements set forth in Table II, Appendix II, following this chapter. For percussion drilled wells, the casing pipe shall be assembled watertight by means of joints welded in accordance with approved practice or by correctly mated drive couplings. Those pipes (six, eight, ten and twelve-inch) marked with an asterisk in Table II, Appendix II, may be used for casing rotary drilled wells, where the casing does not have to be driven, and may be assembled watertight by means of joints welded in accordance with good practice or by correctly mated standard couplings.
(2) No secondhand or reclaimed pipe shall be used as protective casing in the permanent construction of a well
(3) Well casing pipe shall be driven or installed so that there will be no adverse effect on water quality.

(d) Free Flowing Artesian Wells. Every artesian well that flows under natural artesian pressure shall be equipped with a valve which will shut off the flow completely or be plugged for permanent abandonment.

(1) The water well contractor completing such well shall be responsible for installation of a valve to control natural artesian flow or for other means of preventing waste of groundwater.
(2) Subsequent to construction, the well owner shall be responsible for maintenance of the valve or other means of preventing waste of groundwater.

(e) Applicability of Well Classes. Wells for the following uses shall, at a minimum, be constructed to the following classifications, unless unique site and geological conditions approved by the Health Director prevent such construction.
(1) For private water supply systems, Class III on lots greater than three acres;
(2) For public individual water supply systems and private water supply systems constructed on lots of three acres or less, Class II; and
(3) For public multi-user water supply systems, Class I.
(Ord. 88-14. Passed 9-19-88)

1040.13 SPECIFICATIONS FOR CONSTRUCTION OF SHALLOW WELLS

(a) General Requirements. Shallow wells are not desirable from a public health standpoint and shall not be used for new construction, except when deep wells attempted have been nonproductive, as it is normally possible to obtain sufficient water from a deep well.

(b) Existing Shallow Wells. Where existing shallow wells are in use, minimum protection shall consist of the following:
(1) A solid concrete platform shall be provided at least six feet greater in diameter than the well excavation and with a slope of at least one inch from the well to the edge of the concrete. This platform shall be at least six inches thick.
(2) A collar of concrete at least six inches thick shall extend around the outer wall of the casing and fill the annular space from the platform downward at least six feet on existing wells. The concrete shall be poured with a mix of one part Portland cement to two parts clean sand to three parts gravel in one continuous operation from the predetermined depth to the ground surface.
(3) Where hand pumps are installed on shallow wells, the pump bed plate shall be mounted on a concrete base that extends twelve inches above the concrete platform. The pump bed plate shall rest upon a watertight gasket and be bolted in place.
(4) If a power pump is used, a sanitary seal shall be fitted between the sleeve and drop pipe.
(5) The water-bearing formation should be located at least twenty feet below the ground surface and the outside of the casing should be pressure grouted from a point one foot above the water-bearing formation to the ground surface.

(c) Material Specifications. Casing or lining for bored or dug wells shall be concrete, vitrified clay or other strong durable material adequate to maintain the opening and withstand the loads imposed, and all joints shall be sealed to preclude entrance of ground water.

(d) Springs and Surface Water Systems. Springs and surface water supply systems shall be protected and developed so as to prevent surface or ground water contamination and shall provide such treatment as is required to maintain a constant quality, safe for human consumption and/or domestic use. The owner of any spring needing or requesting approval under this chapter must control the use of the entire watershed upslope from the spring in fee simple or by easement running with the land. (Ord. 88-14. Passed 9-19-88)

1040.14 APPURTENANCES

Each well installation shall be provided with the following appurtenances or their equivalent:

(a) A sample tap;
(b) A well vent;
(c) A pressure relief valve;
(d) A gate valve;
(e) A check valve where required;
(f) An electrical disconnect switch on the pump power supply; a plug receptacle connection will not be considered a disconnect switch; and
(g) Well screens. Where well screens are required the screens shall be constructed of Monel Metal, Supernickle, Everdue Metal, silicon bronze, silicon red brass, red brass, stainless steel, Toncan Iron, Armco Iron, steel, or equivalent, with appropriate types of openings.

Public wells shall be equipped with a water meter, and the remote meter indicator shall be located on the exterior of the building in an easily accessible location.
(Ord. 88-14. Passed 9-19-88.)

1040.15 GROUTING PROCEDURES

(a) The annular space or any opening surrounding a well casing shall be completely filled with neat Portland cement grout or with approved bentonite clay/cement grout from an elevation above the established grade of the surface at the well into a continuous impervious formation, or to a safe depth below the probable present or future operating level. The minimum width of the annular space for grouting shall provide a clearance of at least one and one-half inches. Grouting space shall be at least three inches larger than the outside diameter of the casing.
(b) The annular space between the inner or protective casing and the outer casing or hole shall be filled with cement or approve bentonite grout. Any outer casing installed shall be removed during the grouting procedure unless approved by the Health Director prior to the grouting procedure.
    (1) Cement grout shall be proportioned of cement and the minimum quantity of water (five to six and one-half gallons per cubic feet of cement) required to give a mixture of such consistency that it can be forced through the grout pipe.
    (2) Bentonite clay grout may be used when installed by a method approved by the Virginia Department of Health and the Director.

(c) Grouting shall be done by a method which forces the grout from the bottom of the space to be grouted towards the surface. The method of mixing and the consistency of the grout shall insure that the grout fills the annular space. A suitable retainer, packer or plug shall be provided at the lower terminus of the grouting so that grout will not leak through into the water-bearing formation. The grouting shall be done continuously and in such a manner as will insure the entire filling of the annular space in one operation. No drilling operation or other work in the well shall be permitted within seventy-two hours after cement grouting of casings. If high early strength Portland cement is used, this period may be reduced to twenty-four hours. (Ord. 8814. Passes 9-19-88)

1040.16 DISINFECTION AND TESTING PRIOR TO USE

General specifications for disinfecting wells, water service pipe lines, pneumatic storage tanks and other water conveying or storage devices shall be as follows:

(a) Before placing a new system in service, all of the interior surfaces of pipelines and tanks, including the well, shall be disinfected according to the following procedure. The entire system shall be filled with water to which has been added enough of the bactericidal solution to produce fifty ppm of chlorine or equivalent. The solution shall be allowed to stand at least twenty-four hours and shall be flushed with potable water.

(b) After operating the pump for six to twelve hours and after removal of disinfection residual, a sample shall be collected for bacterial examination and, prior to placing the system into service, shall be found negative for coliform bacteria.

(c) Disinfection shall be performed by the person who installs the pumping equipment and should additionally be performed by a licensed plumber upon completion of the plumbing fixture installation when the water system and plumbing system installations are not concurrent.

(d) If testing for safe water after drilling the well identifies the presence of a primary (harmful) contaminant, a test for that contaminant shall be conducted to confirm the adequacy of treatment and a treatment method shall be found so as to reduce the occurrence of the contaminant to a level below the maximum acceptable level prior to placing the system into service (Ord. 88-14. Passed 9-19-88)

1040.17 NOTICE TO CORRECT

If upon inspection, the Health Director or his authorized agent finds a violation of any of the provisions of this chapter and/or the provisions of the permit issued under it, he shall direct the person to whom the permit was issued, and/or the installer of the system, and/or the current owner, by written notice, to make necessary corrections within such reasonable period as is specified therein. No person shall fail to comply with such notice within such period. (Ord. 88-14. Passed 9-19-88.)

1040.18 EQUITABLE REMEDIES

In addition to the penalty provided in Section 1040.99, the Health Director may initiate injunction, mandamus, abatement or other appropriate action to prevent, enjoin, abate or remove a violation of any of the provisions of this chapter. (Ord. 88-14. Passed 9-19-88)

1040.19 INDIVIDUAL WELLS WITHIN THE LIMESTONE OVERLAY DISTRICT APPROVED PRIOR TO FEBRUARY 17, 2010

After February 17, 2010 all wells within the Limestone Overlay District shall be installed in conformance with the setback provisions of this chapter except for any individual well approved by the Loudoun County Health Department prior to February 17, 2010 by issuance of a Well Construction Permit.

1040.99 PENALTY

(EDITOR'S NOTE: See Section 202.99 for general Code penalty if no specific penalty is provided)

APPENDIX I

FEE SCHEDULE

Filing Fees

Application to construct a private well water supply	$ 80.00
Application to construct a public well water supply	$ 115.00
Water supply and on-site sewage evaluation – real estate transfer	$ 70.00

License and Bond Requirements

License fee for well drillers	
First rig	$ 50.00
Each additional rig	$ 25.00
Bond requirement for well drillers	$10,000.00

Note:

1. Licenses are issued annually and are not proratable
2. Permit fees are not charged when existing, in-use water supply facilities are being upgraded or replaced. (Ord. 88-14. Passed 9-19-88)

APPENDIX II – TABLES

Table I
MINIMUM SAFE DISTANCES
LOCATION OF WELLS

SOURCES OF POLLUTION	MINIMUM DISTANCE (Ft.)	
	Class II	Class III
Septic Tank	50	50
Absorption Field	50	100
Cesspools, Pit Privies, etc.	150	150
Sand Filters (watertight)	50	50
Other Sewers	35	35
Property Lines	10	10
Foundation of Buildings of Solid Masonry	15	15
Foundation of Buildings of Wood Framing Or Exterior	50	100

In such installations where Class I or II wells (as per Section 1040.12(b) of this chapter) are constructed, the distance between the potential sources of pollution may be reduced, provided that geological conditions indicate that such would be satisfactory and in accordance with the Division of Engineering, State Health Department, standards for location of public supplies in relation to potential sources of pollution.

Table IA
ADDITIONAL MINIMUM SAFE DISTANCES
FOR LOCATION OF WELLS
LIMESTONE OVERLAY DISTRICT*

	MINIMUM DISTANCE (ft.)	
	Class II	Class III
Sinkholes/Swallet/Closed Depressions (from rim)	100	100
Cave Opening	100	100
Rock Outcrops	10	10
Underground Solution Channels within 45' of the surface	50	50
Perennial Sinking Stream	100	100
Other Karst/Sensitive Enviro. Features (except Springs)	50	50

The minimum distance shall be reduced by up to 50% if a Geophysical Study is conducted in accord with the County's Facilities Standards Manual and such study concludes that the risks of collapse and groundwater contamination are non-existent or insignificant for the proposed location and use, except that no reduction shall be allowed for any Perennial Sinking Stream, nor for any Cave Openings, nor for any Sinkhole/Swallet/Closed Depression that receives an intermittent or Perennial Sinking Stream nor for any rock outcrop.

In addition, water supply systems and wells are prohibited within 1) one hundred (100) feet from a spring, measured from the first emergence of the spring or 2) two hundred) feet when the first emergence of the spring is on a slope greater than 15% and is downslope from the water supply system or well, as applicable.

*All minimum distances listed in Table IA must be met in addition to the minimum distances set forth in Table I.

Table II
CASING PIPE WEIGHTS AND DIMENSIONS

Size (in.)	Weight (lbs./ft.) Threads and Couplings	Pipe		
		Thickness (in.)	Diameter (in.)	
			External	Internal
4	10.89	.237	4.500	4.026
*6	13.00	.188	6.625	6.25
6	19.18	.280	6.625	6.065
*8	17.80	.188	8.625	8.249
8	29.35	.322	8.625	7.981
*10	32.75	.279	10.750	10.192
10	41.85	.365	10.750	10.020
*12	45.45	.330	12.750	12.090
12	51.15	.375	12.750	12.00

* See Section 1040.12(c)(1)
(Ord. 88-14. Passed 9-19-88)

APPENDIX III – MAXIMUM CONTAMINENT LEVELS

The following drinking water standards, exclusive of the eight volatile chemicals, are maximum contaminant levels contained in the Commonwealth of Virginia/State Board of Health, "Waterworks Regulations", Section 4, Tables 4.1 and 4.2 and Appendix B. The eight volatile organic chemicals (VOC's) are based on maximum containment levels promulgated

as a final rule by the united States Environmental Protection Agency in the July 8, 1987, Federal Register, pp 25689-25717.

INORGANIC CHEMICALS

Substance	Primary Maximum Contaminant Level (mg/l)
Arsenic (As)	0.05
Barium (Ba)	1.0
Cadmium (Cd)	0.010
Chromium (Cr)	0.05
Flouride (F)	1.8
Lead (Pb)	0.05
Mercury (Hg)	0.002
Nitrate (as N)	10.0
Selenium (Se0	0.01
Silver (Ag)	0.05

Substance	Secondary Maximum Contaminant Level (mg/l)
Chloride (Cl)	250.0
Copper (Cu)	1.0
Corrosivity	Non-Corrosive
Foaming Agents	0.5*
Iron (Fe)	0.3
Manganese (Mn)	0.05
Sulfate (SO_4)	250.0
Zinc (ZN)	5.0

* Note: Concentration reported in terms of Methylene Blue Active Substances

ORGANIC CHEMICALS

Substance	Primary Maximum Contaminant Level (mg/l)

Chlorinated Hydrocarbon Insecticides	
Endrin	0.0002
Lindane	0.004
Methoxyclor	0.1
Toxaphene	0.005
Chlorophenoxy Herbicides	
2, 4-Dichlorophenoxyacetic Acid (2, 4-D)	0.1
2, 4, 5-Trichlorophenoxypropionic Acid (2, 4, 5-TP or Silvex)	0.01
Volatile Organic Chemicals (VOC's)	
Benzene	0.005
Vinyl Chloride	0.002
Carbon Tetrachloride	0.005
1, 2-Dichloroethane	0.005
Trichloroethylene	0.005
1, 1-Dichloroethylene	0.007
1, 1, 1-Trichloroethane	0.20
Para-Dichlorobenzene	0.075

(Ord. 88-14. Passed 9-19-88.)

APPENDIX IV – CONSTRUCTION AND TESTING OF WELLS

Wells shall be constructed and tested according to the following:

(a) Well Development. The permittee shall develop a well in accordance with the following requirements:

(1) Well development shall consist of cyclic or intermittent pumping, surging, or both, either mechanically or by using water or air under pressure. Development shall continue until all formation cuttings, mud, drilling fluids and additives are removed from the well.

(2) Every well shall be developed by the well driller in order to obtain the full yield of the well and a water quality that meets all of the following requirements.

(b) Well Testing. The well driller shall conduct yield and, when appropriate, drawdown tests as specified in "Rules for the Construction of Groundwater Wells," Virginia Water Control board, and shall report results on Form GW2 to the Health Director.

(c) Pumping Equipment.

(1) The pump capacity shall be consistent with the intended use and yield characteristics of the well

(2) A lightning protective device shall be provided for submersible pumps

(3) Installation of the pump shall be in accordance with the manufacturer's recommendations and in accordance with "Water Systems Handbook", Water Systems Council.

(4) The well shall be vented at the well head to allow for pressure changes within the well due to pumping. Well vents shall be positioned to prevent the entrance of surface water, dust, insects or other foreign material.

(5) Upon completion of installation, the person installing the pump (i.e. the well driller, pump installer or plumber) should disinfect the well, pump and water supply system in accordance with Section 1040.15. the water supply system shall be disinfected in accordance with Section 1040.16 immediately upon completion of construction.

(d) Observation Wells. The Health Director may specify special construction standards for wells installed for the sole purpose of monitoring water quality or water levels.

(e) Domestic Water Supply System Standard.

(1) A well or double well system shall produce at least one gallon per minute.

(2) The water supply system shall produce not less than 500 gallons of water in a two-hour period at least once a day.

(3) If the sustained yield of the well is not capable of meeting the total water supply standard, sufficient storage shall be provided.

(4) Well storage shall conform to the following standards:

A. If well storage is selected, the amount of storage is calculated by subtracting the well yield, as determined in paragraph (e)(2) hereof, over a two-hour period, from 500 gallons

B. The quantity of water in storage in the well is equal to the number of feet between the unpumped static water level and the level of drawdown as determined in the pump test, as provided in paragraph (f)(2)C, hereof, multiplied by 1.5 gallons per foot for a six-inch well or 0.65 gallons per foot for a four inch well.

C. If a six-inch well produces a constant one gallon per minute, it will produce 120 gallons in a two hour period. Therefore, the well storage shall provide 380 gallons (500 gallons – 120 gallons = 380 gallons). To provide this quantity the well shall contain 253 feet of water storage (380 gallons – 1.5 gallons per foot = 253)

D. Table I has been provided to assist in determining the number of feet of water required in well storage to meet the well water supply standard.

(f) Minimum Yield for Domestic Wells.

(1) Each well shall be tested and approved for yield in accordance with paragraph (f)(2) hereof. Replacement wells servicing an existing improved property are exempt from this requirement.

(2) All wells drilled with a yield determined to be less than five gallons per minute, according to subsection (b) hereof, shall be tested as follows:

A. The pump and related equipment shall be placed in the well and the static water level measurement recorded.

B. Pumping shall begin at a rate of withdrawal greater that five gallons per minute until the water level drops to a point close to the bottom of the well.

C. When the water level reaches this point, the pump rate shall be adjusted so that the water level remains constant (in effect, pumping out any water which is flowing into the well).

D. The volume of water discharged (flow meter reading) and the water level (with an electric tape) shall be measured and recorded at fifteen-minute intervals throughout the test.

E. Water shall be discharged at least fifty feet from the well and on-site disposal systems.

F. A single interruption of pumping of up to fifteen minutes due to equipment failure or other unusual circumstances will be permitted, but the amount of downtime shall be made up by additional pumping at the end of the test.

(3) The criteria for approval shall be a minimum yield of one gallon per minute for six hours of continuous pumping after the well has been pumped out as provided in paragraph (f)(2)B hereof.

(4) The pump test can be terminated early and the well yield will be considered adequate if:

A. A well cannot be pumped out after three hours of pumping as provided in paragraph (f)(2)B hereof; and

B. A well yields an average of 2.5 gallons per minute or greater for three hours of continuous pumping, after the well has been pumped out as provided in paragraph (f)(2)B hereof.

(5) The Health Director may permit two wells to be connected to meet the minimum yield requirement. The well to be connected shall be tested in accordance with the procedure described in paragraph (f)(2) hereof, and each well shall demonstrate a yield of 0.5 gallons per minute or greater throughout the entire uninterrupted drawdown phase.

(6) The person conducting the test shall collect a sample to be analyzed for constituents described in Appendix III.

Table I*

Feet of Storage Required in Well to Meet Total Well Water Supply Standard

Nominal Well Sizes (in.)

	2	3	4	5	6	7	8
1.0	--	---	--	375	255	190	150
1.5	--	---	--	315	220	160	125
2.0	---	---	400	255	180	130	100
2.5	---	---	310	200	140	100	80
3.0	---	380	220	140	95	70	55
3.5	---	220	125	80	55	40	35
4.0	125	53	35	15	15	10	10

* Caution: Table I is intended to aid in determining minimum well storage requirements. Additional storage may be necessary to adequately protect the pump during normal operation. (Ord. 88-14. Passed 9-19-88.)